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EXAMINER	
PATEL, JAYESH A	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/531,192	OUCHI, MAKOTO	
	Examiner	Art Unit	
	JAYESH PATEL	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 August 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 April 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/08/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/07/2009 has been entered.

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3,5 ,12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al (US 6078701) hereafter Hsu in view of Chen et al (US 6486908) hereafter Chen and in further view of Nayar et al. (US 7176960) hereafter Nayar.

1. Regarding claim 1, Hsu discloses an image processing apparatus **(Figs 1-3 , an image processor which has integrated circuits executing the steps)** for

generating graphics data representing a single seamless planar image synthesized from multiple sets of graphics data contained in a plurality of graphics files, in response to the plurality of graphics files each of which contains the graphics data composed of a multiplicity of planar pixels arrayed in a plane for representing a planar image, the image processing apparatus comprising:

a feature point extractor configured to extract a feature point which is an area having a predetermined characteristic, from each of the plurality of spheroidal images **(one to one correspondence with points in the scene at Col 1 lines 48-49,Col 4 Lines 65 mapping points between image frames are the features extracted from the images and Col 6 line 54-55 where each point is in one-to-one correspondence)**;

a correspondence relationship determiner configured to determine a correspondence relationship of the extracted feature points, between the plurality of spheroidal images **(Fig 9 and Col 6 lines 36-67 where the mapping is explained)**;

a spheroidal image synthesizer configured to generate seamless spheroidal graphics data representing a single seamless spheroidal image, by synthesizing a plurality of graphics data each of which representing each of the spheroidal images, with reference to the determined correspondence relationship in a three dimensional space **(Fig 9, Col 14 lines 1-10 and Col 17 lines 43-62 where the three dimensional spherical mosaics are generated from two**

dimensional image data showing the relationship in three dimensional space); and

a planar image generator configured to generate the graphics data representing the single seamless planar image, from the seamless spheroidal image graphics data **(Col 12 lines 63 through col 13 lines 57 where reference to image mappings constitutes the planar image from the spherical reference)**. Hsu discloses area of the mosaic based on the perspective projection at **Col 6 lines 36-67 and Col 14 lines 1-5**, however does not explicitly recite a synthesis area establisher configured to establish a spheroidal projection plane centered on a predetermined point, as an area for synthesis of the multiple sets of graphics data and a spheroidal image generator configured to generate a plurality of spheroidal images, by projecting each of planar images represented by each of the multiple sets of graphics data onto the projection plane.

Chen discloses a synthesis area establisher configured to establish a spheroidal projection plane centered on a predetermined point, as an area for synthesis of the multiple sets of graphics data and a spheroidal image generator configured to generate a plurality of spheroidal images, by projecting each of planar images represented by each of the multiple sets of graphics data onto the projection plane **(Figs 13,14 and 19 where the area or the rectangle determines the number of images can fit and a rectangular (planar) image can be used to represent the spherical environment map at Col 6 lines 42-43, abstract also discloses the number of photographs required using the**

center point of each photographs). Hsu discloses the feature point extractor as seen above ,however does not recite in exact claim language a feature point which represents an external characteristics of a subject in an image from each of the plurality of spheroidal images before overlapping the spheroidal images.

Nayar discloses the feature matching to combine the overlapping image strips at **(Col 10 lines 3-10 and Col 14 lines 13-67)**. Nayar's system and method improve the image fidelity in the overlapping regions at **(Col 3 lines 55-56)**. Chen discloses an apparatus **(Fig 1 apparatus with processor which has integrated circuits for processing)** and further discloses that the method and system as disclosed builds the spherical panoramas based on the focal length of the camera, the height of the film and the overlapping ratio between the films thus avoiding the use of fish eye lens giving a better panorama at **Col 2 lines 39-50**. Hsu, Chen and Nayar together would meet the limitations of wherin each of the synthesis area establisher, the spheroidal image generator, the feature point extractor, the correspondence relationship determiner, the spheroidal image synthesizer, and the planar image generator is executed by an integrated circuit **(processors)**. Hsu, Chen and Nayar are from the same field of endeavor and are analogous art, therefore it would be obvious for one of ordinary skill in the art at the time the invention was made to use the teachings of Chen and Nayar in the apparatus of Hsu for the above reasons.

2. Regarding claim 2, Hsu, Chen and Nayar disclose the image processing

apparatus in accordance with claim 1. Chen further disclose wherein the plurality of graphics files further include image attribute information which is attribute information of the graphics data **(film height a, film width b, and focal length are the attributes Col 7 lines 20-25),** a focal length distance determiner being executed by **(Fig 1 processor)**, wherein the image processing apparatus further comprises a focal distance determiner configured to determine a focal distance of an optical system used to generate the multiple sets of graphics data for each of the multiple set of graphics data **(focal length of the camera system col 2 lines 64),** in response to the image attribute information; and the spheroidal image generator generates the plurality of spheroidal images by projecting each planar image represented by each of the multiple sets of graphics data onto the projection plane, the each planar images being placed at a location away from the predetermined point to the projection plane side, by the focal distance corresponding to each of the multiple sets of graphics data **(the number of circles landscape is the planar determination of the images using the focal length of the camera at col 2 lines 53-60)**.

3. Regarding claim 3, Hsu,Chen and Nayar disclose the image processing apparatus in accordance with claim 2. Chen discloses further the focal distance of the camera at **(Col 2 lines 53 through Col 3)**, focal plane resolution, pixel size width and heights at **(Col 6 lines 41-56)**.

4 Regarding claim 5, Hsu, Chen and Nayar discloses and apparatus in accordance to claim 2. Chen discloses further the focal plane resolutions at **(Col 6 Lines 12-56)**. Chen discloses further the focal length and the angle **(180 degree)** divided by the focal length **(f)** at **(Col 7 Lines 47-50)**.

5. Claim 12 is a corresponding method claim of claim 1. See the explanation of claim 1.

6. Claim 14 is a corresponding computer program product claim of claim 1. See the explanation of claim 1.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu, Chen, Nayar and in further view of Muramatsu. (US 5438380) hereafter Muramatsu.

7. Regarding claim 4, Hsu, Chen and Nayar disclose the image processing apparatus in accordance with claim 2. Hsu and Chen both disclose photographic films **(for eg Chen Col 3 Lines 59-67)**. Chen further discloses the spheroidal image generator determines 35 mm film size as a size of the planar image **(Figs 13,14 and 19 where the area or the rectangle determines the number of images can fit and a rectangular (planar) image can be used to represent**

the spherical environment map at Col 6 lines 42-43, abstract also discloses the number of photographs required using the center point of each photographs), discloses the focal length of the camera system and the film height and the width **(at col 3 Lines 1-18)** however do not expressly recite wherein the image attribute information includes 35 mm-equivalent lens focal distance which is a value of focal distance converted to a 35 mm film camera basis; the focal distance determiner determines the 35 mm-equivalent lens focal distance to be the focal distance.

Muramatsu discloses the focal distance (length) of the film from 25mm to 35 mm and the image reproduced **(Col 2 lines 18)**. Muramatsu discloses that the camera provides aspect ratio of good appearance of the photographic images when used in panoramic format **(Col 1 lines 40-45 and 55-56)**. Muramatsu, Hsu, Chen and Nayar are from the same field of endeavor and are analogous art, therefore it would be obvious for one of ordinary skill in the art at the time the invention was made to have used the teachings of Muramatsu in the apparatus of Hsu, Chen and Nayar for the above reasons.

Claims 6, 8, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lipscomb (US 6031541) hereafter Lipscomb in view of Aliaga et al. (US 20020176635) hereafter Aliaga.

8. Regarding Claim 6, Lipscomb discloses an image processing apparatus **(Fig**

1) for generating graphics data representing a single seamless planar image synthesized from multiple sets of graphics data contained in a plurality of graphics files, in response to the plurality of graphics files each of which contains the graphics data composed of a multiplicity of planar pixels arrayed in a plane for representing a planar image, the image processing apparatus comprising:

a synthesis area establisher configured to establish a cylindrical projection plane centered on a predetermined axis, as an area for synthesis of the multiple sets of graphics data **(Fig 12 which shows the number of pictures needed and constitutes the area of the mosaic, Figs 3 and 4 shows multiple rectangular areas and the axis and projections with respect to the cylinder)**;

a cylindrical image generator configured to generate a plurality of cylindrical images, by projecting each of planar images represented by each of the multiple sets of graphics data onto the projection plane **(Figs 5 and 12 which shows multiple cylindrical images projected and aligned in form of a mosaic in fig 12)**; a cylindrical image synthesizer configured to generate seamless cylindrical graphics data representing a single seamless cylindrical image, by synthesizing a plurality of graphics data each of which representing each of the cylindrical images, with reference to the determined correspondence relationship in a three dimensional space **(Fig 13 shows the mapping of the input image into the cylindrical coordinates which is a three dimensional spacem, Col 6 lines 55-60)**; and a planar image generator configured to generate the graphics data representing the single seamless planar image, from

the seamless cylindrical image graphics data at **(Col 6 lines 21-30 where the cylinder is "unrolled" to for a large planar rectangle consisting of the panoramic graphics image)**. Lipscomb discloses the color extraction **(color of the panoramic scene at Col 2 line 67 through Col 3 lines 1and Col 10 lines 35-47 explains the color features)** and the correspondence mapping at **(Fig 20 elements 205-207 the correspondence between the images are determined)**, however does not expressly recite a feature point extractor configured to extract a feature point which represents an external characteristics of a subject in an image, from each of the plurality of cylindrical images before overlapping the cylindrical images.

Aliaga discloses a feature point extractor configured to extract a feature point which represents an external characteristics of a subject in an image **(para 30 which discloses the extraction of features such as points, corners which represents the external characteristics)**, from each of the plurality of cylindrical images before overlapping the cylindrical images **(Para 0039 and 0056 discloses the cylindrical images and also other types of images such as spherical images)** and the stitching is disclosed in **(paras 0034, 0045, 0068-0069)**. Aliaga discloses that the system and method constructs faster and automatic mosaics or stitched images at **(paras 0007, 0010 and 0013)**.

Lipscomb discloses an apparatus **(Fig 1 apparatus with (cpu) processor which has integrated circuits for processing)** and further discloses that the method and system as disclosed builds the cylindrical panoramas as seen in **Fig**

12. Aliaga discloses the apparatus with processor at **(Figs 8-9 and paras 0099)**. Lipscomb and Aliaga together would therefore meet the limitations of wherein each of the synthesis area establisher, the cylindrical image generator, the feature point extractor, the correspondence relationship determiner, the cylindrical image synthesizer, and the planar image generator is executed by an **(processors)**. Therefore it would be obvious for one of ordinary skill in the art at the time the invention was made to have used the teachings of Aliaga in the apparatus of Lipscomb to achieve the claimed invention.

9. Regarding claim 8, Lipscomb and Aliaga disclose the image processing apparatus in accordance with claim 6. Lipscomb discloses further wherein the cylindrical image generator establishes the axis parallel to the height direction established in the graphics data **(Fig 18 where the axis of the cylinder is parallel to the height of the images)**.

10. Claim 13 is a corresponding method claim of claim 6. See the explanation of claim 6.

11. Claim 15 is a corresponding computer program product claim of claim 6. See the explanation of claim 6.

Claims 7, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lipscomb in view of Aliaga and in further view of Chen.

12. Regarding claim 7, Lipscomb and Aliaga disclose the image processing apparatus in accordance with claim 6. Lipscomb discloses the attributes of the images such as height and width of the images **(Figs 18,19)** being used in the panorama construction. Lipscomb and Aliaga are silent and however do not expressly disclose wherein the plurality of graphics files further include image attribute information which is attribute information of the graphics data, wherein the image processing apparatus further comprises a focal distance determiner configured to determine a focal distance of an optical system used to generate the multiple sets of graphics data for each of the multiple set of graphics data, in response to the image attribute information; and the cylindrical image generator generates the plurality of cylindrical images by projecting each planar image represented by each of the multiple sets of graphics data onto the projection plane, the each planar images being placed at a location away from the predetermined axis to the projection plane side, by the focal distance corresponding to each of the multiple sets of graphics data.

Chen discloses the focal length of the camera system **(Col 3 lines 10 computed using Fig 20 processor))** and constructs a warped images of each of the photographic images using the attributes (color) at **(Col 3 lines 55-60, Col 12 lines 1-32)** and thus constructing a seamless spherical image from the

warped images and thus one of ordinary skill in the art would be able to extend the teachings of Chen in construction of cylindrical panoramas. Even the height and width of the film can be understood as the attributes. Chen discloses that the method and system as disclosed builds the spherical panoramas based on the focal length of the camera, the height of the film and the overlapping ratio between the films thus avoiding the use of fish eye lens giving a better panorama at **Col 2 lines 39-50**. Lipscomb, Aliaga and Chen are from the same field of endeavor and are analogous art, therefore it would be obvious for one of ordinary skill in the art at the time the invention was made to use the teachings of Chen in the apparatus of Lipscomb and Aliaga for the above reasons.

13. Regarding claim 9, Lipscomb, Aliaga and Chen disclose the image processing apparatus in accordance with claim 7. Lipscomb discloses further pixel or image height at **(Col 12 lines 1-3)**, pixel width direction at **(Col 13 lines 1-12)**. Chen also discloses the focal plane resolutions at **(Col 6 Lines 12-56)**.

14. Regarding claim 11, see the explanation of claim 9 and also see the angle over width calculation at **(Col 13 line 42 in Lipscomb)**.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lipscomb, Aliaga, Chen and in further view of Muramatsu.

15. Regarding claim 10, Lipscomb, Hsu and Chen disclose the image processing apparatus in accordance with claim 7. Lipscomb, Aliaga and Chen discloses the photographic film however do not expressly recite 35 mm film size. Muramatsu discloses the focal distance (length) of the film from 25mm to 35 mm and the image reproduced **(Col 2 lines 18)**. Muramatsu discloses that the camera provides aspect ratio of good appearance of the photographic images when used in panoramic format **(Col 1 lines 40-45 and 55-56)**. Muramatsu, Lipscomb, Aliaga and Chen are from the same field of endeavor and are analogous art, therefore it would be obvious for one of ordinary skill in the art at the time the invention was made to have used the teachings of Muramatsu in the apparatus of Lipscomb, Hsu and Chen for the above reasons.

Other Cited Prior art

The other cited prior art made of record but not relied on are (US 6532037), (US 6011558), (US 5396583), (US 6002430),(US 20030117488), (US 6028584), (US 5963213),(US 6891561), (US 20020154812), (US 6995790) and (US 20040247173).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAYESH PATEL whose telephone number is (571)270-1227. The examiner can normally be reached on 5-4-9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner can be reached on 571-272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

09/25/2009
/JAYESH PATEL/
Examiner, Art Unit 2624

/Brian P. Werner/
Supervisory Patent Examiner, Art Unit 2624